



Test Report No.: SA160412W003



# RF EXPOSURE REPORT

**Product:** Indoor CPE

**Model Name:** WF821E

**FCC ID:** SRQ-WF821E

**Applicant:** ZTE Corporation

**Address:** ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,  
Nanshan District, Shenzhen, Guangdong, P.R.China

**Manufacturer:** ZTE Corporation

**Address:** ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,  
Nanshan District, Shenzhen, Guangdong, P.R.China

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**Report No.:** SA160412W003

**Received Date:** Apr. 12, 2016

**Test Date:** Apr. 13, 2016 ~ Apr. 25, 2016

**Issued Date:** Apr. 26, 2016

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**VERITAS**

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA160412W003	Original release	Apr. 26, 2016



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## 1 CERTIFICATION

**PRODUCT:** Indoor CPE  
**BRAND NAME:** ZTE  
**MODEL NAME:** WF821E  
**APPLICANT:** ZTE Corporation  
**TESTED:** Apr. 13, 2016 ~ Apr. 25, 2016  
**TEST SAMPLE:** Identical Prototype  
**STANDARDS:** **FCC Part 2 (Section 2.1091)**  
**FCC OET Bulletin 65, Supplement C (01-01)**  
IEEE C95.1

The above equipment has been tested by **Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** , **DATE:** Apr. 26, 2016  
( Amyee Qian / Engineer)

**APPROVED BY :** , **DATE:** Apr. 26, 2016  
( William Chung / Manager)



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Indoor CPE	
<b>BRAND NAME</b>	ZTE	
<b>MODEL NAME</b>	WF821E	
<b>PRODUCT TYPE</b>	Fixed Station	
<b>POWER SUPPLY</b>	12Vdc (POE adapter)	
<b>MODULATION TECHNOLOGY</b>	<b>WLAN</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	<b>LTE</b>	LTE Band 43, QPSK, 16QAM
<b>FREQUENCY RANGE</b>	<b>WLAN</b>	2412-2462MHz for 11b/g/n(HT20)/n(HT40)
	<b>LTE Band 43 (Channel Bandwidth: 5MHz)</b>	3652.5MHz ~ 3697.5MHz
	<b>LTE Band 43 (Channel Bandwidth: 10MHz)</b>	3655.0MHz ~ 3695.0MHz
	<b>LTE Band 43 (Channel Bandwidth: 15MHz)</b>	3657.5MHz ~ 3692.5MHz
	<b>LTE Band 43 (Channel Bandwidth: 20MHz)</b>	3660.0MHz ~ 3690.0MHz
<b>ANTENNA TYPE</b>	WLAN: PCB antenna with 3dBi gain LTE Band 43: Fixed Internal antenna with 7dBi gain	
<b>HW VERSION</b>	A1	
<b>SW VERSION</b>	WF821E_US_V1.0.0B02	
<b>DATA CABLE</b>	N/A	
<b>I/O PORTS</b>	Refer to user's manual	

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapters:

<b>POE ADAPTER 1</b>	
<b>BRAND:</b>	N/A
<b>MODEL:</b>	RD1201000-C55-26MG
<b>INPUT:</b>	AC 100-240V, 600mA
<b>OUTPUT:</b>	DC 12V, 1000mA



<b>POE ADAPTER 2</b>	
<b>BRAND:</b>	N/A
<b>MODEL:</b>	RD1201500-C55-24MG
<b>INPUT:</b>	AC 100-240V, 600mA
<b>OUTPUT:</b>	DC 12V, 1500mA

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.



### 3 RF EXPOSURE

#### 3.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm <sup>2</sup> )	AVERAGE TIME (minutes)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

#### 3.2 MPE CALCULATION FORMULA

$$Pd = (Pout * G) / (4 * pi * r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

#### 3.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 80cm away from the body of the user. So, this device is classified as **Fixed Station**.



### 3.4 CONDUCTED POWER

#### WIFI

##### 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	13.93	N/A
6	2437	14.11	N/A
11	2462	14.38	N/A

##### 802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	12.34	N/A
6	2437	12.39	N/A
11	2462	12.67	N/A

##### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.34	10.44	13.40	N/A
6	2437	10.56	10.32	13.45	N/A
11	2462	10.66	10.45	13.57	N/A

##### 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
3	2422	9.69	9.91	12.81	N/A
6	2437	9.82	9.98	12.91	N/A
9	2452	9.93	10.01	12.98	N/A



**LTE BAND 43**

Band/BW	Modulation	RB Size	RB Offset	CH 44115	CH 44340	CH 44565	MPR
				3652.5 MHz	3675.0 MHz	3697.5 MHz	
43 / 5	QPSK	1	0	27.73	27.72	27.78	0
		1	12	27.53	27.67	27.65	0
		1	24	27.37	27.35	27.37	0
		12	0	26.60	26.52	26.52	1
		12	6	26.39	26.53	26.72	1
		12	13	26.25	26.30	26.30	1
		25	0	26.43	26.39	26.48	1
	16QAM	1	0	27.00	27.04	27.02	1
		1	12	26.87	26.67	26.80	1
		1	24	26.58	26.57	26.67	1
		12	0	25.49	25.50	25.68	2
		12	6	25.45	25.52	25.58	2
		12	13	25.30	25.37	25.40	2
		25	0	25.40	25.50	25.47	2

Band/BW	Modulation	RB Size	RB Offset	CH 44140	CH 44340	CH 44540	MPR
				3655.0 MHz	3675.0 MHz	3695.0 MHz	
43 / 10	QPSK	1	0	27.77	27.76	27.82	0
		1	24	27.57	27.71	27.69	0
		1	49	27.41	27.39	27.41	0
		25	0	26.64	26.56	26.56	1
		25	12	26.43	26.57	26.76	1
		25	25	26.29	26.34	26.34	1
		50	0	26.47	26.43	26.52	1
	16QAM	1	0	27.04	27.08	27.06	1
		1	24	26.91	26.71	26.84	1
		1	49	26.62	26.61	26.71	1
		25	0	25.53	25.54	25.72	2
		25	12	25.49	25.56	25.62	2
		25	25	25.34	25.41	25.44	2
		50	0	25.44	25.54	25.51	2



Band/BW	Modulation	RB Size	RB Offset	CH 44165	CH 44340	CH 44515	MPR
				3657.5 MHz	3675.0 MHz	3692.5 MHz	
43 / 15	QPSK	1	0	27.83	27.82	27.88	0
		1	37	27.63	27.77	27.75	0
		1	74	27.47	27.45	27.47	0
		36	0	26.70	26.62	26.62	1
		36	19	26.49	26.63	26.82	1
		36	39	26.35	26.40	26.40	1
		75	0	26.53	26.49	26.58	1
	16QAM	1	0	27.10	27.14	27.12	1
		1	37	26.97	26.77	26.90	1
		1	74	26.68	26.67	26.77	1
		36	0	25.59	25.60	25.78	2
		36	19	25.55	25.62	25.68	2
		36	39	25.40	25.47	25.50	2
		75	0	25.50	25.60	25.57	2

Band/BW	Modulation	RB Size	RB Offset	CH 44190	CH 44340	CH 44490	MPR
				3660.0 MHz	3675.0 MHz	3690.0 MHz	
43 / 20	QPSK	1	0	27.86	27.85	27.91	0
		1	50	27.66	27.80	27.78	0
		1	99	27.50	27.48	27.50	0
		50	0	26.73	26.65	26.65	1
		50	25	26.52	26.66	26.85	1
		50	50	26.38	26.43	26.43	1
		100	0	26.56	26.52	26.61	1
	16QAM	1	0	27.13	27.17	27.15	1
		1	50	27.00	26.80	26.93	1
		1	99	26.71	26.70	26.80	1
		50	0	25.62	25.63	25.81	2
		50	25	25.58	25.65	25.71	2
		50	50	25.43	25.50	25.53	2
		100	0	25.53	25.63	25.60	2



### 3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

#### WIFI

Band	Frequency (MHz)	Antenna Gain (dBi)	Conducted Time Average Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm <sup>2</sup> )	limit (mW/cm <sup>2</sup> )	PASS / FAIL
11b	2412	3	13.93	49.317	0.001	1.00	PASS
11b	2462	3	14.38	54.702	0.001	1.00	PASS

#### LTE

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Conducted Time Average Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm <sup>2</sup> )	limit (mW/cm <sup>2</sup> )	PASS / FAIL
Band43	3690.0	QPSK	7	27.91	3097.419	0.039	1.00	PASS



### 3.6 CONCLUSION OF SIMULTANEOUS TRANSMITTER

Both of the WLAN and plug-in device can transmit simultaneously, the formula of calculated the MPE is:

$$\text{CPD1/LPD1} + \text{CPD2/LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is  $0.001/1.00 + 0.001/1.00 + 0.039/1.00 = 0.041$ , which is less than "1", This confirmed that the device comply with FCC 1.1310 MPE limit.

--END--